I-3 SAND DUNE AND TIDAL BANK PROTECTION

PURPOSE & APPLICATIONS

It is important to establish and maintain vegetative cover on sand dunes and tidal banks to protect coastal shoreline. To stabilize and provide long term protection for sand dunes and tidal banks, it is necessary to protect dune vegetation from foot traffic and vehicles and to stabilize frontal sand dunes and provide for sand entrapment for dune building. This practice is applicable on any coastal shoreline where vegetation can be expected to effectively stabilize the site.

CONSIDERATIONS

- **Permits:** Any work carried out on coastal dunes will require a permit under the Natural Resources Protection Act (NRPA) from the DEP. Appropriate permits must be obtained prior to beginning work.
- Reducing the movement of sand may result in under-nourishment of nearby beaches.

SPECIFICATIONS

Stabilizing Existing Sand Dunes

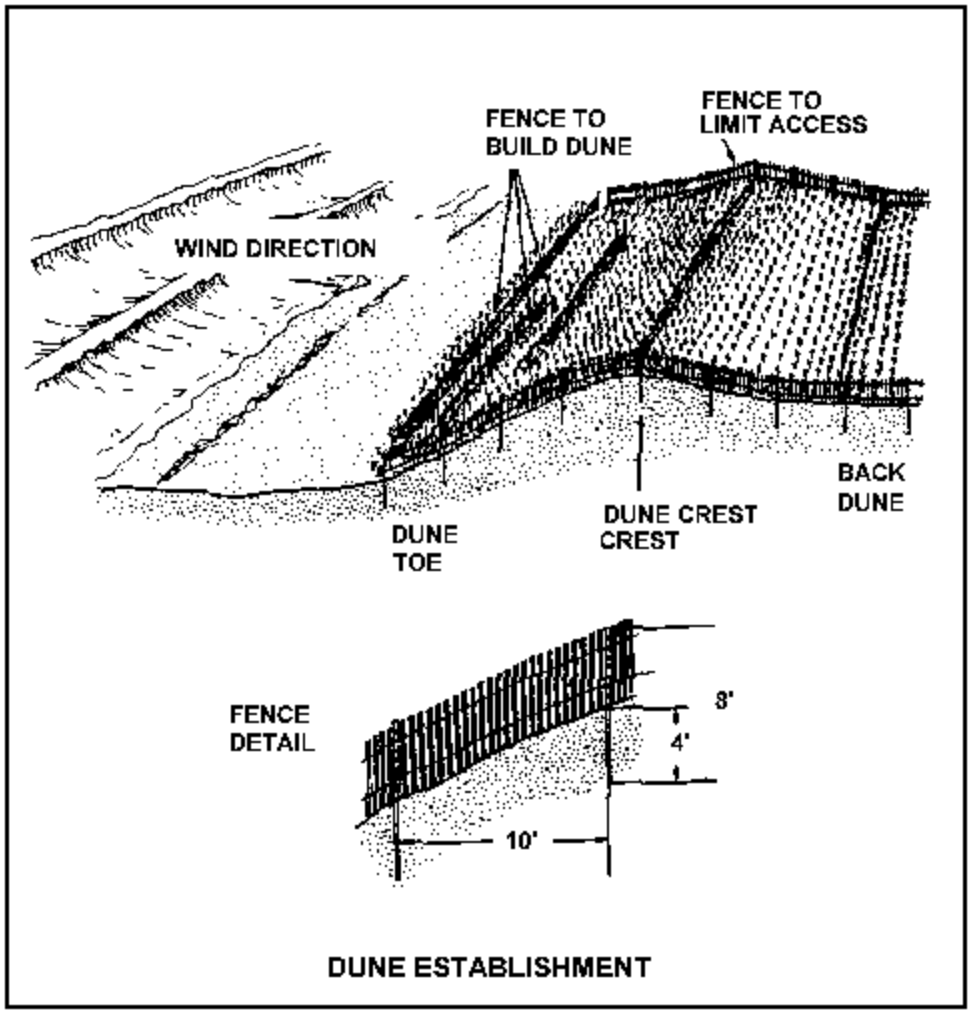
Where stabilization of existing sand dunes and/or re-establishment of beachgrass is needed:

- Certified "Cape" American beachgrass is most useful as an erosion control plant on non-dune areas where soils are very sandy and the site conditions make establishment of seeded species very difficult. It also can be used on soils high in salinity and is the best specie for the initial stabilization of frontal dunes. Planting shall be accomplished by April 30, following the planting recommendations found in USDA-SCS Conservation Plant Sheet No. 28.and 70.
- Smooth cordgrass is a long life perennial and is the dormant most productive marsh plant in the regularly flooded intertidal zone along the Atlantic coast. Smooth cord grass can grow to seven feet tall with stems up to ½ inch in diameter.
- Saltmeadow Cordgrass grows in salt marshes and sandy meadows along the coast. It occupies the area immediately above the intertidal zone. Mature plans are grayish green up to 3 feet tall.
- Certified "Atlantic" coastal panicgrass shall be planted on back dunes at 10 pounds, pure live seed, per acre. Plant from March 1 to June 15.
- Immediately after planting, a sand fence (snow fence) will be built to protect the beachgrass from vehicle and foot traffic. The fence shall surround the planted area at a distance of 15 feet from the planted area. Passageways should be provided to allow pedestrians to cross the planted area at 300-foot intervals. Boardwalks are desirable. Move the opening and boardwalk when beachgrass becomes weak.

Sand Fence plus Vegetation

Bands of vegetation should then be planted parallel to the fence on the landward and seaward. Each band of vegetation should be about 20 feet wide and placed 10 to 15 feet from the sand fence. As the sand fills between the two fences, additional fence can be erected or the area between the fences can be planted. Such a combination can trap

most of all the wind-blown sand crossing the dune area and produce a much broader-based dune than either approach alone.



DUNE ESTABLISHMENT

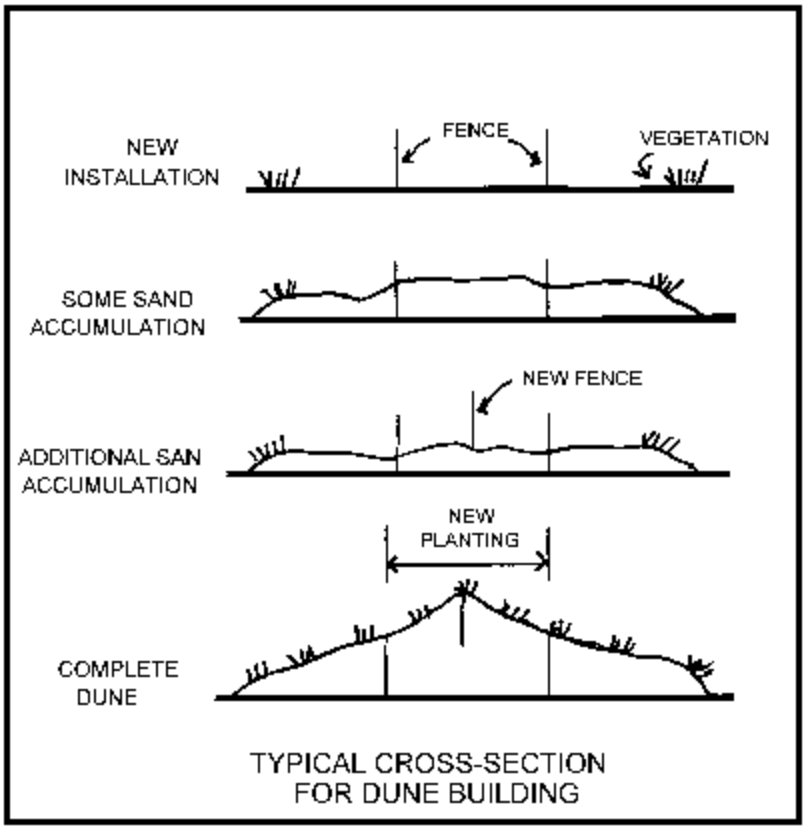
Tidal Streams and Estuaries

The procedures to determine the effectiveness potential of stabilization of tidal streams and estuaries are found in the USDA-SCS Conservation Plant Sheet No. 28 and 70 for planting instruction. Plants to be used are the Certified "Cape" American beachgrass, smooth cordgrass, Certified "Avalon" and saltmeadow cordgrass.

Additional Reference: "Best of Beach Vegetation" by W. Curtis Sharp. Reprints from Parks and Recreation Resources, Vol. 1, Nos. 1, 2, 4 & 5, 7 & 8. Published in January, February, May/June, July/August 1982.

Building, Planting and Maintaining Coastal Sand Dunes

Dune stabilization work must start at least one hundred (100) feet (horizontal distance) from the mean high tide (MHT) line as a minimum. Whenever feasible, leave room for two or more dune lines, a double layer of protection. Dunes grow toward the sand supply, which is the ocean.



TYPICAL CROSS-SECTION FOR DUNE BUILDING

Building the Dune Vegetatively

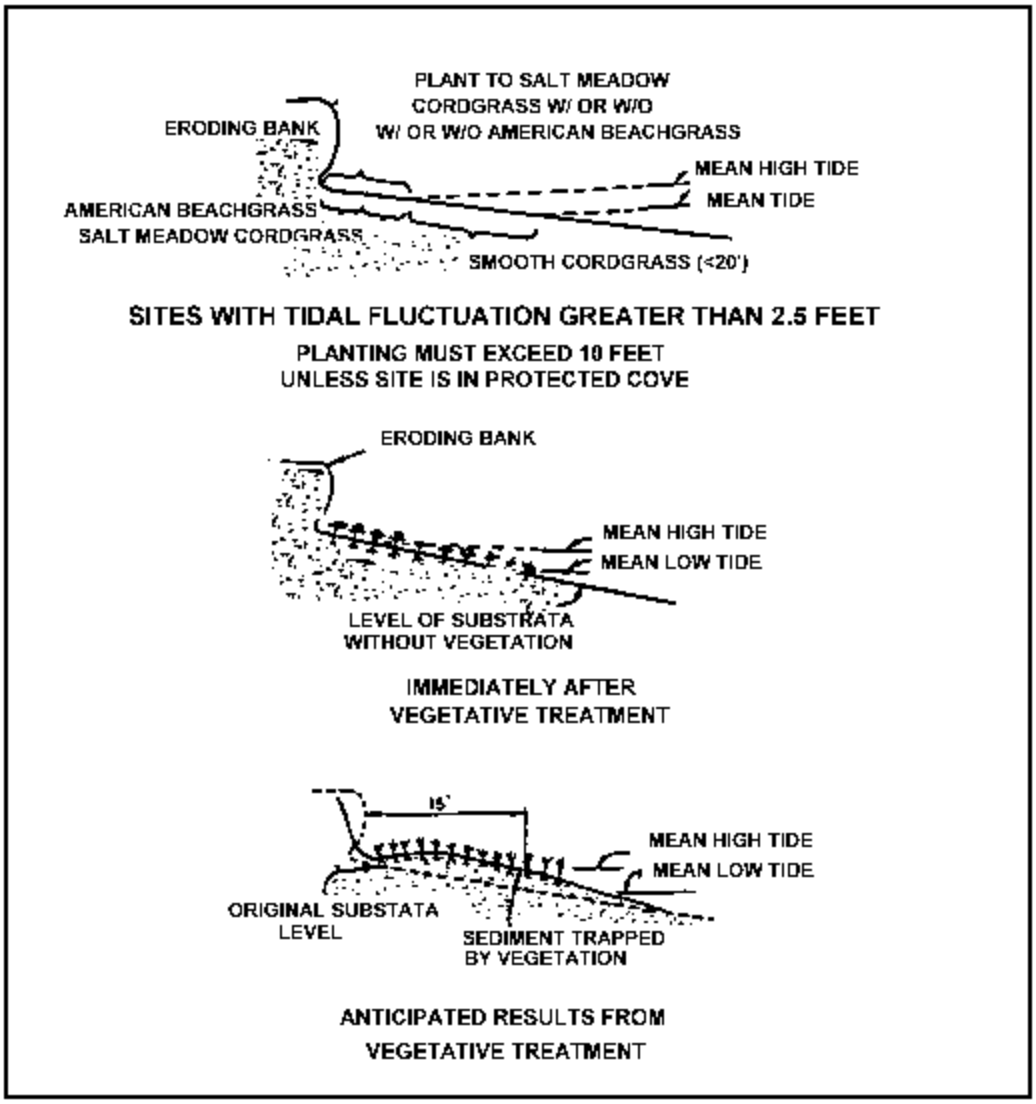
Where blowing sand is available, a simple, relatively inexpensive and successful method exists for building dunes. It consists of planting American beachgrass strips parallel to the coastline. As the windblown sand moves off the beach landward it drops its load of sand, beginning the natural cycle of dune growth. The row closest to the ocean should be at least 100 feet (horizontal distance) from the MHT line. The plantings will trap most of the windblown sand, particularly during the growing season when the grass will continue to grow up through the newly trapped sand.

Building the Dune using Sand Fences (snow fence material)

Use of sand fence is effective and it is readily available. It may be more expensive than building dunes vegetatively, but is less expensive than doing it with machinery. Normally it is also much faster than with vegetation alone.

To form a barrier dune, erect the sand fences, a minimum of 100 feet (horizontal distance) from the MHT line in two parallel rows (three or four rows may be used where sufficient land area and sand is available) 30 or 40 feet apart. The fences should be roughly parallel to the water line and yet be as nearly as possible at a right angle to the prevailing winds.
Where this is not possible, erect a single line of fence parallel with the sea at least 140 feet from the MHT line and space 30 foot long perpendicular spurs 40 feet apart along the seaward side to trap lateral drift. As the fences fill with sand, additional sets of fence can be placed over those filled until the barrier dune has reached a protective height.
To widen an old dune, the fencing should be set seaward at a distance of 15 feet from its base.
Materials: Use standard 4-foot sand (snow) fence. The fence should be sound and free of decay, broken wire and missing or broken slats.
Woods posts for fence support should be black locust, red cedar, white cedar or other wood of equal life or strength. They do not need to be treated. They should be a minimum of 6 feet, 6 inches long and a minimum diameter of 3 inches. Standard fence port length is usually 7 - 8 feet and should be used where possible.
Four (4) wire ties should be used to fasten fence to wood posts. Weave fence between posts so that every other post will have fence on ocean side of posts. Tie wires should be no smaller than 12 gauge galvanized wire.
Posts are to be set no further than 10 feet apart. Posts will be set at least 3 feet deep. The bottom of the fence should be set about 3 inches into the sand, or a mechanical grader could be used to push some sand against the bottom of fence.
Establishing Shoreline planting:
Smooth Cordgrass is planted between the mean low water level and the mean high water level. Saltmeadow cordgrass is planted above the smooth cordgrass from mean high water to the tow of the slope. If the distance from the mean high water to the tow of the slope exceeds 10 feet. American beachgrrass should also be planted in the upper part of the slope.
Establishment of the plants:
There are three types of plant materials that can be used for planting along the shoreline. One type is seedlings grown in peat pots, such plants should be about 12 inches tall with 3-5 stems per container before they are large enough for transplanting. The container is planted with the root mass.
A second method is to grow the plants in containers, which allow the plants' root mass to slip out at the time planting. Their size, etc., is the same as above. The advantage of this method is that it eliminates the barrier occasionally created by the peat pots that may produce a slight turbulence around the plant and wash it out.
A third type is to harvest culms from natural or cultivated stands, which are then planted directly to the shoreline. If the plants are to be taken from natural stands they should be growing in sandy sub strata. The stands should be open and developing rather than dense and mature. The culms will be ready for digging and transporting when the top growth is six to ten inch tall. Each culm should have well-developed root.
Methods one, two and three are equally recommended for smooth cordgrass. Methods one and two are recommended for saltmeadow cordgrass, although method three can be used, but performance expectations will be less than with the other two methods.
When making plantings, place the hills 18 to 36 inches apart within and between rows. The spacing to be used is influenced by the severity of the site. On sites that have a high potential of being washed away, the spacing should be closer. In protected areas where there is little danger form the planting being initially destroyed, the spacing can be wider.

The hole made in the substrata should fully accommodate the plant roots. Be sure to seal the hole by pressing the soil around the roots with your heel.
One or two ounces of fertilizer should be placed in the bottom of the planting hole or in a separate hole to one side of the plant. If this approach is used, a slow released fertilizer should be used. One ounce per hill is recommended. An alternate treatment is to broadcast about 500 lbs. of 10-10-10 fertilizer over the planted area at low tide about three weeks after planting time and some about 6 weeks after planting will give the most rapid growth to the new plantings.



Planting should be made between mid spring and July 1. The early spring plantings are more hazardous because of storms as less favorable soil temperatures. Actual dates are influenced by location. Late spring planting is preferred.

Management of Established Plantings

Plantings should be monitored frequently each year. Plants destroyed or washed out should be replanted as quickly as possible. Plant development and growth surrounding natural marshes must be fertilized in late May or June with 300-500 lbs., per acre of 10-10-10 fertilizer. All debris washed onto the plantings should be immediately removed to prevent smothering the plants.

Plant sources:

Smooth and saltmeadow cordgrasses are available commercially or can be dug locally form an existing marsh. Because commercial sources are subject to change, contact your local USDA Soil Conservation service office for sources closest to you.

MAINTENANCE

Refer to the USDA Conservation Plant Sheet No. 28 and 70 for information about maintenance requirements.